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ABSTRACT

This paper reviews the evolution of the different theories concerning education as a factor of development. It is important to see exactly how the struggle against scarcity and the production of material goods can be made more effective by allocating financial and human resources to the production and transmission of knowledge. The growth theory of the 1960s and 1970s, seeking to account for the typical features that characterized the swift and regular growth of industrial countries, revealed two ways in which education could help to increase the national product: (1) by direct intervention, in line with the theory of human capital, through improvement of the labor factor in the form of higher qualifications; and (2) by indirect intervention in guise of what at the time was called the "unexplained residue of growth," or "technological process" that was understood as a kind of mishmash of the intellectual curiosity, inventiveness, quality of information of the population as a whole and not merely the workforce. The 1980s and 1990s gave fresh impetus to the theory of development through education. Rapid rates of growth were recorded in countries known precisely for the size of their investments in education. Two principal stages in the construction of economic models of the role of education in growth and development are distinguished: (1) the stage marked by the emergence of models of growth incorporating investments in human capital; and (2) the stage marked by the recasting of these models, which culminated at the end of the 1980s in the form known as models of endogenous growth. (DK)

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DEVELOPMENT AND EDUCATION

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Development and Education

by
Danièle Blondel

The relationship between education and development can now be viewed in two ways. Traditionally, development theory, which defined development as a rise in the standard of living (measured for example by per capita output or consumption, thus regarding it as equivalent to economic growth), saw this relationship in terms of a question: **is education a factor of development?** Set within an economic perspective that has been considerably fleshed out in the last decade, education was then studied with reference to its role as a source of increased labour productivity, or more generally, of more efficient production.

For some years, however, (cf. the UNDP reports on "Human Development" or the latest reports of the World Bank), development has been understood in a broader and more complex way[1] as meaning an improvement in the **quality of life**. The World Bank, for example, while noting that this necessarily implies an increase in per capita output in the poorest countries, and stresses that education, like health, for instance, must be considered as **an end in itself**, and not simply as a means of increasing material wealth. This is a humanistic view that conventional economists have not yet adopted and that does not tally with the usual definition of the economic optimum, nor with the traditional field of their science.

Seeking to present a review of economic thinking on the subject of "development and education" this note will therefore confine itself to showing the evolution of the different theories concerning education as a factor of development.

Already, considered in terms of this approach limited by the definition of development, the subject is complex. It has to be seen exactly how the struggle against scarcity and the production of material goods can be made more effective by allocating financial and human resources to the production and transmission of knowledge.

The growth theory of the 1960s and 1970s, seeking to account for the typical features that characterized the swift and regular growth of industrial countries, and the econometric studies associated with it, brought to light two ways in which education could help to increase the national product: by direct intervention, in line with the theory of human capital, through improvement of the labour factor in the form of higher

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[1]As it already was by some economists in the 1960s such as François Perroux, but without this view being generally accepted.

qualifications, and by indirect intervention in guise of what at the time was called the "unexplained residue of growth", or "technological progress" which was understood as a kind of mishmash of the intellectual curiosity, inventiveness, quality of information, etc. of the population as a whole and not merely the workforce[2].

The 1980s and 1990s have given fresh impetus to the theory of development through education. Very rapid rates of growth were recorded in countries like Korea or Japan, which were known precisely for the size of their investments in education, and which are now among the countries with the highest school enrolment rates in the world. Moreover, the World Bank in its 1991 report (page 55), states that: "By improving people's ability to acquire and use information, education deepens their understanding of themselves and the world, enriches their minds by broadening their experiences, and improves the choices they make as consumers, producers and citizens. Education strengthens their ability to meet their wants and those of their family by increasing their productivity and their potential to achieve a higher standard of living. By improving people's confidence and their ability to create and innovate, it multiplies their opportunities for personal and social achievement".

One can therefore distinguish two principal stages in the construction of economic models that aim to show the role of education in growth and development:

1) the stage marked by the emergence of models of growth incorporating investments in human capital. Work on these reached its peak just before the crisis.

2) the stage marked by the recasting of these models, which culminated at the end of the 1980s in the form known as models of "endogenous" growth, despite the ambiguity of the expression[3].

I. The 1960s and 1970s: Human capital as a variable accounting for different growth rates

In the halcyon days when industrialized countries enjoyed a high rate of regular growth, economists asked themselves the reasons for two phenomena:

1) the unprecedented growth in productivity of the factors of capital and labour, as compared with the pre-war period;

2) the divergences in growth rates noted between industrialized and underdeveloped countries, but also between different developed countries.

The absolute and relative growth of gross fixed capital formation and of employment could not by itself account for the trends empirically noted, at least in the

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[2]The most important work in this respect is that of Solow and of Denison. The latter, after studying like Solow the determinants of American growth, became more especially interested in comparing, along with D. Pouiller, the trajectories of industrialized countries in "Why growth rates differ".

[3]For a critical analysis of these models, and more generally of their originality, see (a) Revue de l'OFCE: Observations et diagnostics économiques. F. Lordon: "Théories de la croissance, quelques développements récents", no. 37, July 1991; (b) Revue économique: "Nouvelles théories de la croissance", March 1993.

framework of the "Solow" models[4], based on simple macroeconomic functions of production. Strictly quantitative econometry left an unexplained residue that could amount to three-quarters of the phenomenon. To reduce this residue, G. Becker's theory of "human capital" (The Human Capital: a theoretical and empirical analysis **with special reference to education**". Columbia University Press, 1964) was called to the rescue. Applying the most elementary economic calculation, that is comparing the present costs and yields of a given decision with individual choices in respect of education and training, this theory proposed a very simple two-part equation:

On the one hand, each individual decides to devote money and time to training if the wage differential thus ensured compensates for his expenses and loss of earnings while studying, as compared with the basic wage he would otherwise earn throughout his working life. On the other hand, each firm agrees to pay a higher wage only if the recipient has a productivity higher than that of the basic wage earner. The labour market then achieves an equilibrium between the cost of investment in training, the wage level, and the level of productivity.

This theory seems to be confirmed by the fact that, in general, holders of advanced diplomas get higher wages than those who have received only the compulsory degree of schooling. Transposed to the macroeconomic level, this theory explains both the close relation between a population's level of training and its productivity level (the case of the United States after the war), and part of the differences in growth rates between countries in other ways comparable (for instance Great Britain and Federal Germany).

Incorporated into the standard theory of growth and development, this theory therefore made it possible in the early econometric studies, to limit the unexplained residue of growth. However, even in the most sophisticated econometric studies (notably those of Denison), this residue did not vanish but remained large.

This led the theorists of the time to assume that the growth of production due to the growth of the factors of labour, physical capital and human capital (even when more accurately measured) was so to speak further stimulated by an exogenous growth factor that was thought to enhance the efficiency of the aggregate production function. This was not the result of any economically rational behaviour and was referred to, very vaguely, as "technological progress", for lack of a better phrase, although it included all sorts of qualitative factors such as: volume of research, people's inventiveness, efficient system for reporting and disseminating research outputs, etc. Admittedly, education could make those factors more dynamic, but analysis of its role remained extremely vague.

The theory of growth and development had reached this stage at which it did not even provide a very satisfactory explanation for the high and regular growth rates of the industrialized countries, when these were affected by the crisis that occurred in the 1970s spelling the end of high-performance trends for some time to come and making for greater distortions between nations and continents. some countries seemed to take advantage of the crisis to "catch up" the most efficient (as in South-East Asia), while other regions (such as sub-Saharan Africa), sank deeper into relative and absolute poverty.

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[4]For a synthesis and self-criticism of these models, see R. Solow's speech on the occasion of his being awarded the Nobel prize, reproduced in Les Prix Nobel, presentations, biographies and lectures. Stockholm 1987.

Models of growth then entered a long period of purgatory. They no longer seemed at all able to reply to the central question, which was why should technological progress which, according to them, had generated sustained growth for fifteen or twenty years in some countries, suddenly prove more destructive than constructive in those same countries? Why should the increase in human capital, measured by the increased spending on education in most countries during the 1970s, no longer result in enough productivity to sustain activity? Why should it suddenly be accused of creating unemployment rather than full employment?

In response to these questions, the shortcomings of the standard theoretical model were noted and indeed denounced by two schools of thought. The neo-Schumpeterian school, which rejected the hypothesis of exogenous technological progress, among others, as unrealistic, and, highlighting again the concept of innovation, attempted to arrive once more at a macroeconomics of development, integrating the essential role of the entrepreneur-innovator. This school, insisting after Schumpeter on the fundamentally unbalanced character of a dynamic economy, also called radically into question the notion of the self-regulation of the economy through the free play of market forces.

Moreover, the neo-classical school (in a courageous attempt at self-criticism) first recognized the failings of the development theory that it had been building so far, and then proposed models that purported to be more in line with the prevailing trends and especially with national specificities.

Although the two schools at present share several postulates, particularly that history and institutions are useful in explaining development-related phenomena, and that knowledge and expertise are among the important comparative advantages that may be enjoyed by a country, they seek in different ways to address the theoretical challenge of explaining development, for they hold very opposing views on the hypothesis of economic rationality. The neo-Schumpeterian school aims essentially to develop a new microeconomics that incorporates uncertainty, diversity, learning processes and the relations of non-market forces in its analysis of the behaviour of economic agents. The neo-classicists for their part continue to seek a definition of the macroeconomic optimum which would take account of individual behaviour and public policies, both of them conforming to the purest economic rationality.

In the present state of economic theory, the question of how national and international research and education policies can make it possible to harness the potential created by technological progress is then perhaps more explicitly raised in the "endogenous growth" approach chosen by this neo-classical school than it is in the case of the evolutionistic (neo-Schumpeterian) school.

II. The 1980s and 1990s. The role of education in "endogenous" growth.

The shortcomings of the usual version of the model of so-called "balanced" growth that are most frequently denounced are as follows:

Steady, sustained growth is an exogenous process, resulting from the concurrence of population growth and technological progress. It depends neither on the behaviour of economic agents (investment in material or non-material capital), nor on public policies.

Since technological progress is available to all, the growth rates due to this factor should converge; but this is not the case.

The hypothesis of exogenous technological progress, regarded as a kind of godsend, is incompatible with the behaviour of dynamic firms, which invest in research and employ research workers.

In reply to these criticisms, models that refer to the idea of endogenous growth insist in different ways on non-material factors which are seen as the basis for development. Some thinkers believe that it is essentially a matter of accumulating technologies, while others believe that everything hinges on education. Others again consider both to be necessary, in varying degrees of complementarity. For most, however, the important point is that in all cases this accumulation is due to intention, economic calculation, in that the result of the investment (in either research or training) can be appropriated by the investor company or individual), and at the same time is due to non-intention or "externality" by way of the establishment of a stock of public goods comprising the sum of knowledge accumulated in space and time which is available to everyone.

Whereas the early models treated research as a public good and training as a private investment, these new models see all non-material investment as a combination of the two. Private investment in research or training is then particularly productive when it is made in a geographical and historical context marked by a high concentration of knowledge. For example, a person holding a diploma in higher education will be less productive in a largely illiterate country than a person holding a similar diploma in Japan. Conversely, individual expenditure is profitable not only to the person incurring it but also to the community, which therefore stands to gain from encouraging or even subsidizing it. Non-material investment is then by its nature at the origin of **cumulative processes**. This is an argument that militates strongly in favour of aid policies for research and education since countries will find it useful to create comparative advantages for themselves by this means or at least to prevent vicious circles of non-material poverty from being created.

These models then provide several pointers about the role of education in development.

1) This role is multifaceted. It involves not only qualifications for the labour force through diplomas, as in the early model, but also the basic schooling provided through national education systems. This schooling serves as the fertile subsoil of future individual investments and of all types of education whereby knowledge is passed down through the generations, whether through apprenticeship or other means. Accordingly, Prescott and Boyd (1987) propose an interesting coalition of the younger and older generations, all of whom must work, since the "old" must devote part of their time to training the young in skills that will increase their productive capacity. The concern is also of course with the training needed for research, that is, with higher scientific education. In practice this means that in all these models, the level of research is a simple function of the human capital devoted to science. And this in turn is itself a function of the length of training and of the level of human capital already accumulated. Hence some models distinguish a so-called "research" sector, which uses human capital both for research itself and for the purpose of training human capital for other sectors that produce consumer goods and capital goods.

In this way all branches of education - basic education, formal and informal vocational training and higher education are assigned complementary roles in these new approaches to development.

2. Responsibility for this accumulation of non-material resources consisting of knowledge in the broad sense (education and research **is shared between individuals and the community**. The latter has every reason to levy taxes in order to secure the resources needed to finance education and research policies, since these will enhance the profitability of private investments. But individuals must still be able to make their own decisions on non-materials investments whose results can be appropriated and thus form a private human capital which, in certain conditions and after a certain time, will in turn contribute to the public stock of knowledge.

The social optimum is then not the same as the general equilibrium resulting from individual rational behaviour patterns. Policy-makers must take into account that progress here is swifter if the level already reached is high and if there is scope for it.

Without answering all the questions raised by the discrepancies between theory and empirical data from the 1980s, these new models are interesting as systems of hypotheses concerning the role of education in development and the importance of education policies.

Two advances are particularly worth noting :

First, the theory of human capital as formulated in terms of strict individual economic calculation presupposing perfect knowledge of the present and future states of the labour market, has been superseded through the introduction of the notion of the irreversibility of history and, at the same time, a rational justification has been found for infrastructures and collective systems of teaching, training and research.

Secondly, the fact of combining the role of human capital with increasing returns to scale and externalities by generating cumulative processes, offers the beginning of an explanation for spurts of growth and the increasing discrepancies between the trajectories of different countries. In this way, these analyses can make a considerable contribution to the building of models showing how developing countries can "catch up".

The fact remains that these advances are purely theoretical, and are often to be found piecemeal in a variety of models. Conditions for an optimum development policy are still far from clear, even though they are being sought with new hypotheses. Similarly, the relationship remains very vague between the traditional factors of growth (physical capital and volume of employment), and the new determinants of development included within the accumulation of non-material capital.

It would therefore be well to consider that these developments represent interesting analytical advances, rather than normative models. However, it is interesting and significant that, although produced by the economic school most representative of liberal thinking, these studies highlight the deficiencies of the self-regulating market and the theory of general equilibrium in determining the social optimum. They thereby confer a purely economic legitimacy on interventionism in development, which may amplify terms of the political choice in the field of education.